

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Ex-Parte Re-examination of

U.S. Patent No. 5,819,292

Issued: October 6, 1998

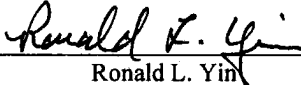
Applicant: Hitz et al.

Filed: May 31, 1995

Title: METHOD FOR MAINTAINING CONSISTENT STATES OF A FILE SYSTEM
AND FOR CREATING USER-ACCESSIBLE READ-ONLY COPIES OF A
FILE SYSTEM

Control Number 90/008,903

Docket No.: 347155-29

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage Via Express Mail No. EV 978 428 105 US in an envelope addressed to: Commissioner of Patents, MS BOX REEXAM, P.O. Box 1450, Alexandria, VA 22313-1450, on: December 26, 2007

Ronald L. Yin

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RESPONSE TO NOTICE OF FAILURE TO COMPLY WITH EX PARTE REEXAMINATION
FILING REQUIREMENTS (37 CFR 1.510(C))

ATTN: BOX REEXAM
Commissioner of Patents
Washington, D.C. 20231

Sir:

In response to the notice mailed December 10, 2007 ("Notice"), Requester has attached herewith a Replaced Attachment for Re-Examination complying with 37 CFR 1.510(c). Specifically, in the Notice, the PTO stated that the prior art, MENDEL ROSENBLUM, et al., "The Design and Implementation of A Log-Structured File Systems", Proceedings of the 13th ACM Symposium on Operating Systems Principles, 1991, pages 1-15 (Rosenblum I), cited in PTO/SB/08 was not discussed. This has been rectified and the applicability of Rosenblum I to claim 4 of U.S.P. 5,819,292 ('292 Patent) is set forth in the Replacement Attachment.

In addition, the Notice stated that U.S. patent 7,174,352 is not available as prior art. Requester agrees. In fact, U.S. patent 7,174,352 is not listed in PTO/SB/08. The relevance of U.S. Patent 7,174,352 is with regard to claim 52 presented during the prosecution of U.S. Patent 7,174,352, in which Lorie (a reference cited in PTO/SB/08) was used to reject then pending claim 52. Claim 52 is similar if not identical to claim 1 of the '292 Patent. Claim 52 was properly rejected by Lorie, and as a result claim 1 of the '292 Patent should similarly be rejected by Lorie.

A copy of this response as well as the Replacement Attachment is served on the patent owner as provided in 37 CFR 1.33(c). The name and address of the party served and the date of service are:

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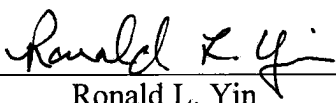
Served On: December 26, 2007

Any fee due for this reexamination may be charged to Deposit Account No. 07-1896.

Respectfully submitted,

DLA PIPER US LLP

Date: December 26, 2007

By: 
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Hitz et al.

U.S. Patent No. 5,819,292

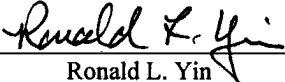
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Title: METHOD FOR MAINTAINING CONSISTENT STATES OF A FILE SYSTEM
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Ronald L. Yin

* * *

REPLACEMENT ATTACHMENT TO REQUEST FOR RE-EXAMINATION (FORM PTO-1465) PROVIDING INFORMATION ON U.S. PATENT NO. 5,819,292

ATTN: BOX REEXAM
Commissioner of Patents
Washington, D.C. 20231

Sir:

Pursuant to 35 U.S.C. §§ 302-307 and 37 CFR § 1.510, this is a request for ex-parte reexamination of United States Patent Number 5,819,292 which issued on October 6, 1998 to Hitz et al. (the “’292 Patent”). This document is a replacement attachment, replacing the attachment filed on October 25, 2007.

I. CLAIMS FOR WHICH REEXAMINATION IS REQUESTED

Reexamination is requested of Claims 1-4, and 8-20 of the ‘292 Patent in view of the prior art listed on the Citation of Prior Art under 37 CFR § 1.501 and 35 U.S.C. § 301 which is submitted with the Request for Reexamination.

**II. EXPLANATION OF PERTINENCY AND MANNER OF APPLYING CITED
PRIOR ART TO EVERY CLAIM FOR WHICH REEXAMINATION IS REQUESTED**

Introduction

One or more prior art references submitted with the Citation of Prior Art render claims 1-4, and 8-20 of the '292 Patent either anticipated under 35 USC 102 (a), (b) or (e) or unpatentable under 35 USC 103 so that substantial new questions of patentability of the claims in the '292 Patent have been raised by this request for reexamination. For each claim for which reexamination is sought, a specific citation of the prior art or combination of prior art pertinent to the claim and a description of the relevancy of that prior art to the claim are set forth below in more detail. None of the prior art cited in the Citation of Prior Art was submitted to the examiner or considered by the examiner during the prosecution of the '292 Patent.

Statements Identifying Substantial New Questions of Patentability

The following Substantial New Questions (SNQ) of Patentability are raised with respect to claims 1-4 and 8-20 of the '292 Patent in view of the prior art listed on the Citation of Prior Art.

SNQ 1. A substantial new question of patentability as to claims 1, 8-10, 14-17, and 20 is raised by the reference Lorie.

SNQ 2. A substantial new question of patentability as to claim 1 is raised by the reference Yamasaki.

SNQ 3. A substantial new question of patentability as to claims 2-4, 8, 12-13, and 18-20 is raised by the reference Borg.

SNQ 4. A substantial new question of patentability as to claim 4 is raised by the reference Rosenblum I.

SNQ 5. A substantial new question of patentability as to claims 2-4, 12-13, and 18-19 is raised by the reference Rosenblum II.

SNQ 6. A substantial new question of patentability as to claims 2, 8, 11, and 20 is raised by the reference Hecht.

Explanation of How Each SQN Is Raised

1. The Lorie reference contains a teaching of storing a plurality of states, in which the Mod bit and the shadow bits record multiple usage bits per block. The shadow bits release slots in the current bit map thereby demonstrating reusability, with the result that an actual release of a slot by a showdown bit results in the reusing of one of the blocks. This teaching was not present during the prior examination of the '292 Patent. It is believed that a reasonable examiner would consider this teaching important in determining whether or not the claims are patentable. In fact, originally filed claim 52 of USP 7,174,352, which claims priority from the filing date of the '292 Patent presented similar if not identical claim as claim 1 of the '252 Patent, and originally filed claim 52 was rejected on the basis of Lorie. Thus, this teaching of Lorie raises a substantial new question of patentability with respect to at least claim 1 of the '292 Patent. Note that requester does not assert that USP 7,174,352 is prior art. Rather requester submits that the rejection of claim 52 (similar, if not identical to claim 1 of the '292 Patent) presented in the prosecution of the '352 Patent by Lorie demonstrates the materiality of Lorie to claim 1 of the '292 Patent.

2. The Yamasaki reference contains a teaching of subdividing a memory into blocks and using two bitmaps to store information about the usage of each block. The two bit maps store multiple usage bits per delimited memory block. If the bit in the second map is not written, the corresponding memory block is released. This teaching was not present during the prior examination of the '292 Patent. It is believed that a reasonable examiner would consider this teaching important in determining whether or not the claims are patentable. Thus, this teaching of Yamasaki raises a substantial new question of patentability with respect to at least claim 2 of the '292 Patent.

3. The Borg reference contains a teaching of a file stored in a non-volatile means, such as a disk, blocks of regular file data and blocks of meta-data file referencing the blocks of data of the file system, at a first consistency point. The computer also has a memory means. The modified blocks of regular file data and meta-data file data are maintained in memory. The modified blocks of data are modified from the first consistency point. This teaching was not present during the prior examination of the '292 Patent. It is believed that a reasonable examiner would consider this teaching important in determining whether or not the claims are patentable. Thus,

this teaching of Borg raises a substantial new question of patentability with respect to at least claim 2 of the '292 Patent.

4. The Rosenblum I reference contains a teaching of writing out all modified information to the log, including file data blocks, indirect blocks, inodes, and blocks of the inode map and segment usage table. The file system of Rosenblum I stores a checkpoint region that identifies a consistent state of the file system maintained in log form. The file system of Rosenblum I buffers and then writes out to a disk-based log all modified files. Finally, after writing out the modified data, the file system of Rosenblum I writes out a second checkpoint region that contains the addresses of all the blocks in the inode map and segment usage table, thereby describing the state of the file system at a second consistency point. This teaching was not present during the prior examination of the '292 Patent. It is believed that a reasonable examiner would consider this teaching important in determining whether or not the claims are patentable. Thus, this teaching of Rosenblum I raises a substantial new question of patentability with respect to at least claim 4 of the '292 Patent.

5. The Rosenblum II reference contains a teaching of the maintenance of plural consistency points, as well as providing a memory for cache. A plurality of modified blocks of regular file data and meta-data file data are maintained in the memory means, and the modified blocks of data comprise blocks of data modified from the first consistency point. Dirty blocks are also designated. Modified blocks of regular file data are copied to free blocks of the non-volatile storage means. This teaching was not present during the prior examination of the '292 Patent. It is believed that a reasonable examiner would consider this teaching important in determining whether or not the claims are patentable. Thus, this teaching of Rosenblum II raises a substantial new question of patentability with respect to at least claim 2 of the '292 Patent.

6. The Hecht reference contains a teaching of a checkpoint or snapshot with read only access, which is periodically taken and transferred to disk. This teaching was not present during the prior examination of the '292 Patent. It is believed that a reasonable examiner would consider this teaching important in determining whether or not the claims are patentable. Thus, this teaching of Hecht raises a substantial new question of patentability with respect to at least claim 8 of the '292 Patent.

A detailed explanation of the SNQ as applied to claims 1-4, and 8-20 of the '292 Patent by each of the cited references is set forth hereinbelow.

Invalidity

Claim 1

Claim 1 of the '292 Patent is remarkably similar if not identical to claim 52 as originally filed in the application which matured into USP 7,174,352 ("352 Patent") (see Ex. A attached hereto). The '352 Patent claims priority from the filing date of the '292 Patent and is alleged to be a continuation-in-part of the '292 Patent. A comparison of issued claim 1 of the '292 Patent to originally filed claim 52 of the '352 shows that the claims are virtually identical.

US Patent No. 5,819,292	Originally Filed Claim 52 of '352 Patent
1. A method for recording a plurality of data about a plurality of blocks of data stored in storage means comprising the steps of:	52. A method for recording a plurality of data about a plurality of blocks of data stored in storage means, comprising the steps of:
maintaining a means for recording multiple usage bits per block of said storage means,	maintaining a means for recording multiple usage bits per block of said storage means; and
storing, in said means for recording multiple usage bits per block, multiple bits for each of said plurality of said blocks of said storage means; and	storing in said means for recording multiple usage bits per block, multiple bits for each of said plurality of said blocks of said storage means,
reusing at least one of said plurality of blocks of data in response to at least one of said multiple usage bits.	at least one of said multiple bits being indicative of block reusability.

As can be seen, the preamble and the first two elements of claim 1 of the '292 Patent and originally filed claim 52 of the '352 Patent are word-for-word identical. As for the last element of claim 1 of the '292 Patent, claim 52 also teaches the reusability concept, although not expressed as a separate method step. Originally filed claim 52 of the '352 Patent was rejected by examiner Le (different from the examiner for the '292 Patent), who rejected claim 52 as being anticipated under 35 U.S.C. 102(b) by Lorie. (see Ex. B). In rejecting claim 52, the examiner noted that Lorie disclosed Mod bit and shadow bit (pages 95-97) which met the claimed limitation of "maintaining a means for recording multiple usage bits per block of said storage means." Further, Lorie disclosed using shadow bits to release slots in the current map (page 99 of Lorie) as meeting the claimed limitation of "storing in said means for recording multiple

usage bits per block, multiple bits for each of said plurality of said blocks of said storage means, at least one of said multiple bits being indicative of block reusability” (see page 3 of Ex. B)

The applicants conceded the relevance of Lorie and the appropriateness of the rejection when claim 52 was cancelled in response to the rejection. (see Ex. C).

Thus, claim 1 of the ‘292 Patent is anticipated by Lorie as follows:

US Patent No. 5,819,292	Lorie
1. A method for recording a plurality of data about a plurality of blocks of data stored in storage means comprising the steps of:	Lorie discloses storing a plurality of states. See at least the abstract.
maintaining a means for recording multiple usage bits per block of said storage means,	Mod bit and shadow bits (page 95-97) record multiple usage bits per block.
storing, in said means for recording multiple usage bits per block, multiple bits for each of said plurality of said blocks of said storage means; and	Shadow bits release slots in the current bit map (page 99) demonstrates reusability.
reusing at least one of said plurality of blocks of data in response to at least one of said multiple usage bits.	Actual release of a slot by a shadow bit results in the reusing of one of the blocks (page 99).

Claim 1 of the ‘292 Patent is also anticipated by U.S. Pat 5,129,085 (“Yamasaki”) as follows:

US Patent No. 5,819,292	U.S. patent 5,129,085 (“Yamasaki”)
1. A method for recording a plurality of data about a plurality of blocks of data stored in storage means comprising the steps of:	Yamasaki teaches subdividing a memory into blocks and using two bitmaps to store information about the usage of each block. See Figure 1.
maintaining a means for recording multiple usage bits per block of said storage means,	See column 2, lines 54-66 which discloses a first bit map and a second bit map corresponding to a delimited memory area.
storing, in said means for recording multiple usage bits per block, multiple bits for each of said plurality of said blocks of said storage means; and	The two bit maps store multiple usage bits per delimited memory block (see column 2, lines 54-66).
reusing at least one of said plurality of blocks of data in response to at least one of said multiple usage bits.	If the bit in the second map is not written, the corresponding memory block is released; see column 4, lines 31-36.

Claim 2

Claim 2 of the '292 Patent is anticipated by Borg as follows:

US Patent No. 5,819,292	Borg
2. A method for maintaining a file system stored in non-volatile storage means at successive consistency points said file system comprising blocks of data, said blocks of data comprising blocks of regular file data and blocks of meta-data file data referencing said blocks of data of said file system, said meta file data comprising a file system information structure comprising data describing said file system at a first consistency point said computer system further comprising memory means, said method comprising the steps of:	Section 4.3 and Figure 2 of Borg discloses a file stored in a non-volatile means (a disk) blocks of regular file data and blocks of meta-data file referencing the blocks of data of the file system, at a first consistency point (see Figure 2a). The computer system also has memory means (see Figure 2a).
maintaining a plurality of modified blocks of regular file data and meta-data file data in said memory means, said modified blocks of data comprising blocks of data modified from said first consistency point;	Figure 2b shows the modified blocks of regular file data and meta-data file data being maintained in memory. The modified blocks of data are modified from the first consistency point shown in Figure 2a.
designating as dirty blocks of meta-data file data referencing said modified blocks of regular file data and meta-data file data, said dirty blocks of meta-data file data comprising blocks of meta-data file data to be included in a second consistency point;	See Figures 2(a-c) and discussion in section 4.3
copying said modified blocks of regular file data referenced by said dirty blocks of meta-data file data to free blocks of said non-volatile storage means;	See Figures 2(a-c) and discussion in section 4.3
copying blocks comprising said modified blocks of meta-data file data referenced by said dirty blocks of meta-data file data to free blocks of said non-volatile storage means;	See Figures 2(a-c) and discussion in section 4.3
modifying a copy of said file system information structure maintained in said memory means to reference said dirty blocks of meta-data file data;	See Figures 2(a-d) and discussion in section 4.3
copying said modified file system information structure to said non-volatile storage means.	See Figures 2(a-d) and discussion in section 4.3

Claim 2 of the '292 Patent is also anticipated by Rosenblum II, as follows:

US Patent No. 5,819,292	Rosenblum II
2. A method for maintaining a file system stored in non-volatile storage means at successive consistency points said file system comprising blocks of data, said blocks of data comprising blocks of regular file data and blocks of meta-data file data referencing said blocks of data of said file system, said meta file data comprising a file system information structure comprising data describing said file system at a first consistency point said computer system further comprising memory means, said method comprising the steps of:	See sections 4.4.1 (page 9) with regard to the discussion on the maintenance of plural consistency points. See also section 2.2 (page 2) and section 4.4.1 (page 9) with regard to providing a memory (or cache).
maintaining a plurality of modified blocks of regular file data and meta-data file data in said memory means, said modified blocks of data comprising blocks of data modified from said first consistency point;	See section 4 in general and section 4.4.1 in particular. See also section 4.2.1.
designating as dirty blocks of meta-data file data referencing said modified blocks of regular file data and meta-data file data, said dirty blocks of meta-data file data comprising blocks of meta-data file data to be included in a second consistency point;	See section 4 in general and section 4.4.1 in particular. See also section 4.2.1.
copying said modified blocks of regular file data referenced by said dirty blocks of meta-data file data to free blocks of said non-volatile storage means;	See section 4 in general and section 4.4.1 in particular. See also section 4.2.1.
copying blocks comprising said modified blocks of meta-data file data referenced by said dirty blocks of meta-data file data to free blocks of said non-volatile storage means;	See section 4 in general and section 4.4.1 in particular. See also section 4.2.1.
modifying a copy of said file system information structure maintained in said memory means to reference said dirty blocks of meta-data file data;	See section 4 in general and section 4.4.1 in particular. See also section 4.2.1.
copying said modified file system information structure to said non-volatile storage means.	See section 4 in general and section 4.4.1 in particular. See also section 4.2.1.

Claim 2 of the '292 Patent is also anticipated by Hecht, as follows:

US Patent No. 5,819,292	Hecht
2. A method for maintaining a file system stored in non-volatile storage means at successive consistency points said file system	Section 2 and in particular sections 2.2 and 2.3 discloses storing of both the old page and modified page in disk, written thereto from

US Patent No. 5,819,292	Hecht
comprising blocks of data, said blocks of data comprising blocks of regular file data and blocks of meta-data file data referencing said blocks of data of said file system, said meta file data comprising a file system information structure comprising data describing said file system at a first consistency point said computer system further comprising memory means, said method comprising the steps of:	memory. See also section 3 with regard to the disclosure of a main memory.
maintaining a plurality of modified blocks of regular file data and meta-data file data in said memory means, said modified blocks of data comprising blocks of data modified from said first consistency point;	Section 2 and in particular sections 2.2 and 2.3.
designating as dirty blocks of meta-data file data referencing said modified blocks of regular file data and meta-data file data, said dirty blocks of meta-data file data comprising blocks of meta-data file data to be included in a second consistency point;	Section 2 and in particular sections 2.2 and 2.3.
copying said modified blocks of regular file data referenced by said dirty blocks of meta-data file data to free blocks of said non-volatile storage means;	Section 2 and in particular sections 2.2 and 2.3.
copying blocks comprising said modified blocks of meta-data file data referenced by said dirty blocks of meta-data file data to free blocks of said non-volatile storage means;	Section 2 and in particular sections 2.2 and 2.3.
modifying a copy of said file system information structure maintained in said memory means to reference said dirty blocks of meta-data file data;	Section 2 and in particular sections 2.2 and 2.3.
copying said modified file system information structure to said non-volatile storage means.	Section 2 and in particular sections 2.2 and 2.3.

Claim 3

Claim 3 of the '292 Patent is anticipated by Borg as follows:

US Patent No. 5,819,292	Borg
3. The method of claim 2 wherein said blocks of meta-file data comprise one or more blocks of inode file data and one or more blocks of blockmap file data and wherein said step of	An inode file data is disclosed in section 4.2.

US Patent No. 5,819,292	Borg
copying said modified blocks of meta-data file data to free blocks of said non-volatile storage means further comprises the steps of:	
copying an inode referencing one or more blocks of blockmap file data to a block of inode file data maintained in said memory means;	The inode file data is modified in memory – see sections 4.2, 4.3 and Figure 2.
allocating free blocks of said non-volatile storage means for said block of inode file data and one or more modified blocks of blockmap file data:	The modified blocks are written to disk – see section 4.2. See also section 4.3 and Figure 2.
updating said inode referencing said one or more blocks of blockmap file data to reference said one or more free blocks of said non-volatile storage means allocated to said one or more modified blocks of blockmap file data;	See sections 4.2 and 4.3 and Figure 2.
copying said updated inode to said block of inode file data;	See sections 4.2 and 4.3 and Figure 2.
updating said one or more blocks of blockmap file data;	See sections 4.2 and 4.3 and Figure 2.
writing said updated one or more blocks of blockmap file data and said block of inode file data to said allocated free blocks of said non-volatile storage means.	See sections 4.2 and 4.3 and Figure 2.

Claim 3 of the '292 Patent is also anticipated by Rosenblum II as follows:

US Patent No. 5,819,292	Rosenblum II
3. The method of claim 2 wherein said blocks of meta-file data comprise one or more blocks of inode file data and one or more blocks of blockmap file data and wherein said step of copying said modified blocks of meta-data file data to free blocks of said non-volatile storage means further comprises the steps of:	An inode file data is disclosed in section 4.1. See also section 4.2.1.
copying an inode referencing one or more blocks of blockmap file data to a block of inode file data maintained in said memory means;	The inode file data is modified in memory – see section 4.1. see also section 4.2.1.
allocating free blocks of said non-volatile storage means for said block of inode file data and one or more modified blocks of blockmap file data:	The modified blocks are written to disk – see section 4.1. See also section 4.2.1.
updating said inode referencing said one or	See sections 4.2 and 4.3 and in particular

US Patent No. 5,819,292	Rosenblum II
more blocks of blockmap file data to reference said one or more free blocks of said non-volatile storage means allocated to said one or more modified blocks of blockmap file data;	sections 4.2.1 and section 4.3.1 through 4.3.5.
copying said updated inode to said block of inode file data;	See sections 4.2 and 4.3.
updating said one or more blocks of blockmap file data;	See section 4.4.
writing said updated one or more blocks of blockmap file data and said block of inode file data to said allocated free blocks of said non-volatile storage means.	See section 4.4.

Claim 4

Claim 4 of the '292 Patent is anticipated by Borg as follows:

US Patent No. 5,819,292	Borg
4. A method for maintaining a file system comprising blocks of data stored in blocks of a non-volatile storage means at successive consistency points comprising the steps of:	Section 4.3 and Figure 2 of Borg discloses a file stored in a non-volatile means (a disk) blocks of regular file data and blocks of meta-data file referencing the blocks of data of the file system, at a first consistency point (see Figure 2a).
storing a first file system information structure for a first consistency point in said non-volatile storage means, said first file system information structure comprising data describing a layout of said file system at said first consistency point of said file system;	See section 4.3 and Figure 2.
writing blocks of data of said file system that have been modified from said first consistency point as of the commencement of a second consistency point to free blocks of said non-volatile storage means;	See section 4.3 and Figure 2.
storing in said non-volatile storage means a second file system information structure for said second consistency point, said second file system information structure comprising data describing a layout said file system at said second consistency point of said file system.	See section 4.3 and Figure 2.

Claim 4 of the '292 Patent is anticipated by Rosenblum I as follows:

US Patent No. 5,819,292	Rosenblum I
4. A method for maintaining a file system comprising blocks of data stored in blocks of a non-volatile storage means at successive consistency points comprising the steps of:	Rosenblum I teaches a file system comprising data blocks stored on disk at successive consistency points by "writing out all modified information to the log, including file data blocks, indirect blocks, inodes, and blocks of the inode map and segment usage table." Rosenblum I, Sec. 4.1, p. 9. The file system of Rosenblum I maintains two checkpoint regions referencing consistent states of the file system. <i>Id.</i>
storing a first file system information structure for a first consistency point in said non-volatile storage means, said first file system information structure comprising data describing a layout of said file system at said first consistency point of said file system;	The file system of Rosenblum I stores a checkpoint region that identifies a consistent state of the file system maintained in log form. Rosenblum I, Sec. 3., 3.1, 4, 4.1.
writing blocks of data of said file system that have been modified from said first consistency point as of the commencement of a second consistency point to free blocks of said non-volatile storage means;	The file system of Rosenblum I buffers and then writes out to a disk-based log all modified files. Rosenblum, Sec. 3, 4.1.
storing in said non-volatile storage means a second file system information structure for said second consistency point, said second file system information structure comprising data describing a layout said file system at said second consistency point of said file system.	After writing out the modified data, the file system of Rosenblum I writes out a second checkpoint region that contains the addresses of all the blocks in the inode map and segment usage table, thereby describing the state of the file system at a second consistency point. Rosenblum, Sec. 4.1, pp. 9-10.

Claim 4 of the '292 Patent is also anticipated by Rosenblum II as follows:

US Patent No. 5,819,292	Rosenblum II
4. A method for maintaining a file system comprising blocks of data stored in blocks of a non-volatile storage means at successive consistency points comprising the steps of:	See section 4.4 and in particular section 4.4.1
storing a first file system information structure for a first consistency point in said non-volatile storage means, said first file system information structure comprising data describing a layout of said file system at said first consistency point of said file system;	See sections 4.2, 4.3 and 4.4.
writing blocks of data of said file system that have been modified from said first consistency	See sections 4.2, 4.3 and 4.4.

US Patent No. 5,819,292	Rosenblum II
point as of the commencement of a second consistency point to free blocks of said non-volatile storage means;	
storing in said non-volatile storage means a second file system information structure for said second consistency point, said second file system information structure comprising data describing a layout said file system at said second consistency point of said file system.	See sections 4.2-4.4.

Claim 8

Claim 8 of the '292 Patent is anticipated by Borg as follows:

US Patent No. 5,819,292	Borg
8. A method for creating a plurality of read-only copies of a file system stored in blocks of a non-volatile storage means, said file system comprising meta-data identifying blocks of said non-volatile storage means used by said file system, comprising the steps of:	Section 4.2 and 4.3 and Figure 2 discloses the formation of a plurality of consistency points. As each new consistency point is created, the "old" consistency point become a read-only copy.
storing meta-data for successive states of said file system in said non-volatile storage means;	See section 4.2, 4.3 and Figure 2 wherein meta-data is also stored in the disk.
making a copy of said meta-data at each of a plurality of said states of said file system;	See Figure 2 and sections 4.2 and 4.3.
for each of said copies of said meta-data at a respective state of said file system, marking said blocks of said non-volatile storage means identified in said meta-data as comprising a respective read-only copy of said file system.	See Figure 2 and sections 4.2 and 4.3 wherein the data associated with an "old" consistency point becomes "read only"

Claim 8 of the '292 Patent is also anticipated by Lorie as follows:

US Patent No. 5,819,292	Lorie
8. A method for creating a plurality of read-only copies of a file system stored in blocks of a non-volatile storage means, said file system comprising meta-data identifying blocks of said non-volatile storage means used by said file system, comprising the steps of:	Section 4.1 and Figure 5 show a long term checkpoint with a plurality of saves.
storing meta-data for successive states of said file system in said non-volatile storage means;	See section 4.1 and Figure 5.
making a copy of said meta-data at each of a	See section 4.1 and Figure 5.

US Patent No. 5,819,292	Lorie
plurality of said states of said file system;	
for each of said copies of said meta-data at a respective state of said file system, marking said blocks of said non-volatile storage means identified in said meta-data as comprising a respective read-only copy of said file system.	See section 4.1 and Figure 5

Claim 8 of the '292 Patent is also anticipated by Hecht as follows:

US Patent No. 5,819,292	Hecht
8. A method for creating a plurality of read-only copies of a file system stored in blocks of a non-volatile storage means, said file system comprising meta-data identifying blocks of said non-volatile storage means used by said file system, comprising the steps of:	See section 2.3 in which a checkpoint or a "snapshot" with read-only access is periodically taken and transferred to disk.
storing meta-data for successive states of said file system in said non-volatile storage means;	See section 2.3.
making a copy of said meta-data at each of a plurality of said states of said file system;	See section 2.3.
for each of said copies of said meta-data at a respective state of said file system, marking said blocks of said non-volatile storage means identified in said meta-data as comprising a respective read-only copy of said file system.	See section 2.3.

Claim 9

Claim 9 of the '292 Patent is anticipated by Lorie as follows:

US Patent No. 5,819,292	Lorie
9. The method of claim 8 wherein said step of marking said blocks comprising a respective read-only copy of said file system comprises placing an appropriate entry in a means for recording multiple usage bits per block of said non-volatile storage means.	Section 3.1 discloses the existence of a STATUS bit, associated with the data.

Claim 10

Claim 10 of the '292 Patent is anticipated by Lorie as follows:

US Patent No. 5,819,292	Lorie
10. The method of claim 9 wherein said means for recording multiple usage bits per block of said non-volatile storage means comprises a blockmap comprising multiple bit entries for each block.	Lorie discloses a STATUS bit as discussed for claim 9. Figure 3 shows a plurality of STATUS bits associated with a plurality of slots, which is collectively a block. Thus, multiple bits are associated with each block.

Claim 11

Claim 11 of the '292 Patent is obvious in view of Hecht as follows:

US Patent No. 5,819,292	Hecht
11. The method of claim 8 wherein said meta-data comprises pointers to a hierarchical tree of blocks comprising said file system.	Hecht discloses in section 4.2 (page 509) the use of pointers. The use of pointers to a hierarchical tree of blocks for the meta-data would have been obvious to one of ordinary skill in the art.

Claim 12

Claim 12 of the '292 Patent is anticipated by Borg as follows:

US Patent No. 5,819,292	Borg
12. The method of claim 8 wherein said meta-data comprises structures representing files of said file system.	Borg shows in sections 4.2, 4.3 and Figure 2 meta-data as files.

Claim 12 of the '292 Patent is also anticipated by Rosenblum II as follows:

US Patent No. 5,819,292	Rosenblum II
12. The method of claim 8 wherein said meta-data comprises structures representing files of said file system.	Sections 4.2-4.4 discloses meta-data as files.

Claim 13

Claim 13 of the '292 Patent is anticipated by Borg as follows:

US Patent No. 5,819,292	Borg
13. The method of claim 12 wherein said	Borg is applied to claim 12 and section 4.2

US Patent No. 5,819,292	Borg
structures representing files of said file system comprise inodes.	discloses the use of inodes.

Claim 13 of the '292 Patent is also anticipated by Rosenblum II as follows:

US Patent No. 5,819,292	Rosenblum II
13. The method of claim 12 wherein said structures representing files of said file system comprise inodes.	Rosenblum II is applied to claim 12 and section 4.1 discloses the use of inodes.

Claim 14

Claim 14 of the '292 Patent is anticipated by Lorie as follows:

US Patent No. 5,819,292	Lorie
14. The method of claim 8 further comprising the step of: preventing overwriting of said blocks marked as belonging to a read-only copy of said file system.	Lorie discloses the use of a STATUS bit (see section 3). The STATUS bit indicates whether the block can be rewritten or not.

Claim 15

Claim 15 of the '292 Patent is anticipated by Lorie as follows:

US Patent No. 5,819,292	Lorie
15. The method of claim 8 comprising the step of unmarking said blocks marked as belonging to a read only copy of said file system when said read only copy of said file system is no longer needed.	Lorie discloses the use of a STATUS bit (see section 3). The STATUS bit indicates whether the block can be rewritten or not.

Claim 16

Claim 16 of the '292 Patent is anticipated by Lorie as follows:

US Patent No. 5,819,292	Lorie
16. The method of claim 8 wherein a plurality of said blocks marked as belonging to a read-only copy of said file system comprise data ancillary to said file system, said method further including the steps of:	See sections 3.1 and 3.2.

US Patent No. 5,819,292	Lorie
allowing said ancillary data to be overwritten; and	See sections 3.1 and 3.2 (and Figures 3 and 4) wherein certain segments are overwritten
otherwise preventing overwriting of said blocks marked as comprising a read only copy of said file system	See sections 3.1 and 3.2 and Figures 3 and 4.

Claim 17

Claim 17 of the '292 Patent is obvious in view of Lorie as follows:

US Patent No. 5,819,292	Lorie
17. The method of claim 16 wherein said ancillary data comprises access time data.	Whether the ancillary data is access time data would be a matter of design choice.

Claim 18

Claim 18 of the '292 Patent is anticipated by Borg as follows:

US Patent No. 5,819,292	Borg
18. The method of claim 8 wherein said meta- data comprises a root structure referencing structures representing files of said file system, and wherein said copies of said meta-data comprise copies of said root structure.	See Sections 4.2 and 4.3 and Figure 2.

Claim 18 of the '292 Patent is also anticipated by Rosenblum II as follows:

US Patent No. 5,819,292	Rosenblum II
18. The method of claim 8 wherein said meta- data comprises a root structure referencing structures representing files of said file system, and wherein said copies of said meta-data comprise copies of said root structure.	See Sections 4.1-4.4.

Claim 19

Claim 19 of the '292 Patent is anticipated by Borg as follows:

US Patent No. 5,819,292	Borg
19. The method of claim 18 wherein said root structure comprises a root inode.	Borg is applied to claim 18 and section 4.2 discloses inode.

Claim 19 of the '292 Patent is also anticipated by Rosenblum II as follows:

US Patent No. 5,819,292	Rosenblum II
19. The method of claim 18 wherein said root structure comprises a root inode.	Rosenblum II is applied to claim 18 and section 4.1-4.4 discloses inode.

Claim 20

Claim 20 of the '292 Patent is anticipated by either of Borg, Lorie or Hecht as follows:

US Patent No. 5,819,292	Borg, Lorie or Hecht
20. The method of claim 8 further comprising the step of using one or more of said read-only copies of said file system to back-up said blocks comprising one or more consistency points of said file system.	Borg – see sections 4.2 and 4.3 and Figure 2. Lorie – see section 4.1. Hecht – see section 2.3.

**III. STATEMENT POINTING OUT SUBSTANTIAL NEW QUESTION OF
PATENTABILITY**

Since claims 1-4 and 8-20 of the '292 Patent are not patentable over the prior art references cited above for the reasons set forth above, a substantial new question of patentability is raised for each claim. Further, these prior art references cited above are material to the subject matter of the '292 Patent. In particular, these prior art references provide teachings not provided during the prosecution of the '292 Patent. Therefore, a substantial new question of patentability has been raised, and reexamination is respectfully requested.

CONCLUSION

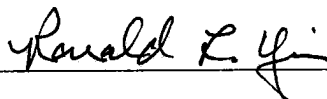
Based on the above remarks, it is respectfully submitted that a substantial new question of patentability has been raised with respect to Claims 1-4 and 8-20 of the '292 Patent. Therefore, reexamination of Claims 1-4 and 8-20 is respectfully requested.

Any fee due for this reexamination may be charged to Deposit Account No. 07-1896.

Respectfully submitted,

DLA PIPER US LLP

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